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IN THE CLAIMS

Please amend the claims as follows:

Claim 1 (Previously Presented): A quantum circuit comprising:

means for representing a quantum bit by at least one polarization direction of light;

means for sequentially supplying a sequence of polarized light pulses representing a quantum bit string to a means for determining an amount of polarization rotation and a phase difference applied to a certain light pulse on the basis of a polarization measurement of a preceding input light pulse sequence, realizing a controlled-unitary transform configured to cause a phase difference between a polarization indicating a  $|0\rangle$  state and a polarization indicating a  $|1\rangle$  state.

Claim 2 (Canceled).

Claim 3 (Previously Presented): The quantum circuit according to claim 1, further comprising:

means for coupling a plurality of outputs of a polarization beam splitter via a polarization maintaining fiber; and

a phase modulator arranged in a position deviated from a middle point of the polarization maintaining fiber, thus causing the phase difference between the polarization indicating the  $|0\rangle$  state and the polarization indicating the  $|1\rangle$  state.

Claim 4 (Previously Presented): The quantum circuit according to claim 1, wherein in the sequence of polarized light pulses representing the quantum bit string, a number of photons included in a single pulse is larger than 1.

Claim 5 (Canceled).

Claim 6 (Previously Presented): The quantum circuit according to claim 3, wherein in the sequence of polarized light pulses representing the quantum bit string, a number of photons included in a single pulse is larger than 1.

Claim 7-9 (Canceled).

Claim 10 (New): A computer apparatus including a quantum circuit comprising:  
means for representing a quantum bit by at least one polarization direction of light;  
means for sequentially supplying a sequence of polarized light pulses representing a quantum bit string to a means for determining an amount of polarization rotation and a phase difference applied to a certain light pulse on the basis of a polarization measurement of a preceding input light pulse sequence, realizing a controlled-unitary transform configured to cause a phase difference between a polarization indicating a  $|0\rangle$  state and a polarization indicating a  $|1\rangle$  state.